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Invited Article

The Contributions of Kenelm Hutchinson Digby to Orthopaedics in Hong Kong Part 2
坎奈姆·狄比教授Professor Kenelm Hutchinson Digby對香港骨科的貢獻(第二部)

Fu Kuo-tai Louis*

Second Floor, South Hillcrest, 3 Tuen Kwai Road, Tuen Mun, Hong Kong

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ABSTRACT

As the first professor of surgery in Hong Kong, Kenelm Hutchinson Digby had the tremendous task of building a new clinical department in the infant University of Hong Kong from scratch. Despite his heavy commitments in clinical, administrative, and teaching responsibilities, he pioneered novel orthopaedic treatment principles and techniques, in addition to that of general surgery.

中 文 摘 要

坎奈姆·狄比教授作為香港的第一位外科教授，不得不負起從頭開始在一所新大學中建立一個新的臨床部門的艱鉅任務。儘管他在臨床、行政、教學的職責繁重，除了在外科的貢獻，他還開創了新的骨科治療原則和技巧。

Introduction

For over two millenniums, people of the Chinese Empire thrived on their indigenous traditional medicine and bone-setting. Modern medicine in China owes its inception to Anglo-American medical missionaries arriving in the first half of the nineteenth century. Western-style medical education in Hong Kong commenced in 1887 with the founding of the Hongkong College of Medicine for Chinese. This College, staffed by part-time lecturers, was the stock onto which the University of Hong Kong was grafted in 1912. In the beginning there were only two faculties: Medicine and Engineering. Professor Digby was the one of the first two full-time University staff. In this second part, Digby's other contributions to the theory and the practice of orthopaedics in Hong Kong are presented.

Orthopaedic appliances

Digby proposed more applications of the pneumatic tourniquet in limb surgery.

Plea for the general use of pneumatic tourniquet

The usual practice of arresting haemorrhage in limbs during operations by winding tightly stretched elastic tubing has certain disadvantages. The assistant may fail to apply the tourniquet with sufficient tightness, or the tourniquet is applied so as to exert unnecessary degree of compression resulting in nerve and vessel injuries. The ordinary sphygmomanometer makes an excellent pneumatic tourniquet. It has the following advantages:

(1) No violence can be caused by its application.
(2) Only the minimum pressure required is employed.
(3) The tourniquet can be inflated or released easily and instantaneously.[1]

Due to the hot Hong Kong summer, Digby noted the unsuitability of rubber pneumatic tourniquet. He began to test different pressure gauges in conjunction with compression.

Preliminary note on a tourniquet meter

The need for some methods of measuring the pressure exerted on the limb by a tourniquet has long been recognized. The sphygmomanometer has two drawbacks: its bulky nature and its

* Corresponding author. *E-mail:* louisfu@kinetics.hk.

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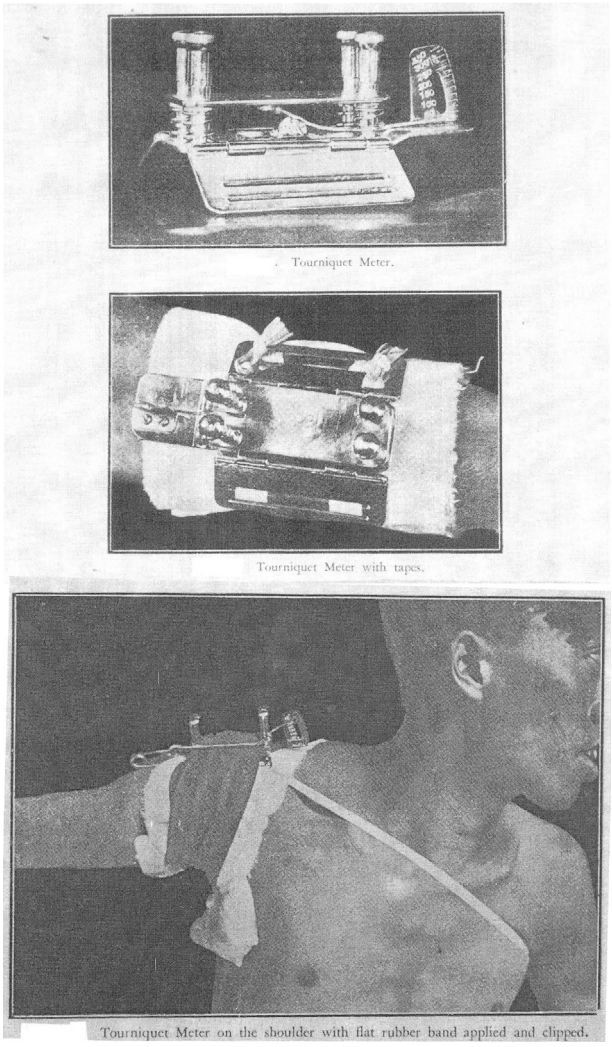

Figure 1. Tourniquet meter devised by Digby for application in limb surgery. From Digby [2]. Permission for reproduction has been applied to *The Caduceus: Journal of the Hong Kong University Medical Society*.

sterilisability. Time has been expended in this clinic in trying to provide a more suitable and equally safe tourniquet. A special narrow sterilisable pneumatic tourniquet with pressure page has been devised, but the rubber, at least in a tropical climate, does not last well, and the tourniquet is difficult to adjust to all sizes of limbs. In 1932, George Salter and Co. Ltd., West Bromwich, England, prepared a light meter to be used beneath a Martin bandage. This pattern has subsequently been modified in the light of experience by the university's Ho Tung Engineering Workshop (Figure 1). It is a practice to apply a pressure equivalent to 200 mmHg for the upper limb and 250 mmHg for the lower limb, for nearly all cases in adults. These have been safely left on for an hour, and could possibly be left on longer without harm. The meter consists of two flat plates of duralumin. To the lower plate is attached on each side a hinged flap. Each flap has two slots for the attachment of tapes. The lower plate is prolonged at one end to bear a vertical scale. Four vertical rods are attached to the lower plate through holes in the upper plate. On these rods and the plates are four metal springs, and between the plates also is situated the lever attachment from which the pointer passes to the scale. The four rods pass well above the plates and arc covered by screw caps. For operations high up the limbs, the meter is applied to the top of the shoulder or to the lateral aspect of the hip. The projecting ends of the four rods prevent the rubber bandage from slipping down the limb, and the meter itself is prevented from sliding by means of tapes passing through the slots in the side flaps. These should be knotted on the upper side of the side flaps (Figure 1). In the case of the shoulder, one tape is secured around the opposite axilla, and another round the arm on the side to be compressed. A pad of wool is required between the anterior and posterior folds of the axilla on the side to be compressed, so that the projecting folds do not shelter the artery from the general pressure. In the case of the hip, one tape is tied around the opposite hip midway between the greater trochanter and the crest of the ilium, and the second tape encircles the top of the thigh. A small pad may be used over the trigonum femorale if there is definite concavity.[2]

Tumour surgery

Case of myeloma of the radius, extirpation of the lower 3 inches of the radius, bone graft, and recovery

The patient was a lady of 48 years of age who had sprained her wrist 11 months earlier. The sprain subsided, but 4 months after the injury, a swelling had appeared on the lateral half of the dorsal aspect of her left wrist. Since its appearance, the swelling had steadily increased, spreading proximally up the forearm and distally to the bases of the metacarpal hones, and forwards to the ventral aspect of the wrist. On examination, the swelling clearly involved the radius, the surface of which sloped up to the tumour. The consistency of different parts of the tumour varied from very soft to fairly hard. Eggshell crackling was not detected. The skin over the swelling was freely movable. The wrist movements were somewhat limited. The appearances suggested a tumour expanding the lower end of the bone. Such a tumour is usually a myeloma or an endosteal sarcoma. The lower end of the radius is a common site for the development of myeloma. The X-rays gave the characteristic appearance of a myeloma. It was decided to resect the lower part of the radius together with its periosteum and the tumour, keeping well outside its thin capsule. On December 2, 1926, a 6-inch incision was made along the anterolateral border of the wrist and lower part of the radius. The radius was divided with a motor saw at its lower point of trisection, and the dissection carried down from above. Parts of the tendons of the extensores carpi radialis longus et brevis were excised with the tumour, as they had become enveloped in its growth. The prolongation of the growth onto the back of the carpus was especially difficult to excise with a safe margin. A graft was next shaped from the patient's own tibia. One end was pegged with shoulders to fit into the medullary cavity, and the other end was cut much broader with its distal margin oblique. The whole graft was more than half an inch longer than the piece of radius, which was removed. This was done in order to ensure a tight fit and to diminish any subsequent tendency to radial abduction. No-hand-touch and strict-skin-segregation techniques were observed throughout, and the wounds healed without trouble. The forearm and hand were kept in removable plaster for 3 months. The large proportion of giant cells and the large number of nuclei in each are characteristic of a myeloma [*author's comment: or rather a giant-cell tumour*] as opposed to an endosteal sarcoma (Figure 2). Over 1 year since the operation, there has been no recurrence of the growth and the hand is moderately useful. The graft has survived and functioned with some success.[3]

Reconstructive surgery

Case of old ununited fracture of the patella with wide separation of fragments, excision of patella, musculo-aponeurotic transplant to close

On December 3, 1937, a Chinese male was admitted with inability to extend his right knee joint following an injury 4 months